
I. Introduction

Three years of work by the Galveston Bay National Estuary Program have established a strong foundation for improved management of this nationally significant resource. In the remaining two years of the five-year process, the work already accomplished will become the foundation for an ecosystem-level comprehensive management plan. This Fiscal Year 1993 Annual Work Plan outlines year four: a year that will position the Management Conference for attainment of its estuarine management goals (see box on next page).

Year four will see the culmination of numerous scientific studies in a single *Galveston Bay Environmental Characterization Report* which will describe the problems faced by the estuary, trends related to those problems, and their probable causes and management implications. A related public document, *The State of the Bay*, will publicize findings and document the imperative nature of improved Bay management. Each of these documents will be "under construction" throughout the year.

While scientific work to characterize Galveston Bay for comprehensive planning will be scaled back during the coming year, some scientific needs remain. Design of a coordinated and systematic effort to monitor conditions in the estuary and to measure the effect of the management plan (when implemented) will be a high priority for the Scientific/Technical Advisory Committee. In addition to Bay-wide monitoring, several additional projects will fill in knowledge gaps identified earlier in the program, to round out our technical requirements for management planning. Work on the *Environmental Characterization Report* will be facilitated by convening of a major symposium in Fall, 1992, with the theme of identifying probable causes of estuarine problems. This conference will be a key element in drafting the *Environmental Characterization Report*.

Drafting of Bay management initiatives will dominate the work of the Management and Policy Committees in the coming year, and program resources are progressively being shifted to this task. Guidance in this use of resources continues to come from the *Galveston Bay Priority Problems List* (Table 1). These problems were further defined in the *Galveston Bay Ecosystem Impact Matrix* (Figure 1). Together, these tools have helped establish a conceptual basis for organizing the CCMP.

Sixteen Action Plan Task Forces were convened by the Program Director to address elements of the *Action Plan Topics List*. The lead task force among these, the Framework for Action Task Force, has already begun to guide the efforts of these task forces to draft action plans which will compose the CCMP. This work was initiated two and a half years prior to the final draft of the CCMP to allow successive cycles of Management Conference and public review and revision.

Also contributing to the management planning effort in the coming year will be

Program Goals

The Galveston Bay Estuary System is a public asset of immense value and is worthy of preservation and improvement to realize its full potential in enriching the lives of the citizens of Texas and the United States. In developing goals for the Comprehensive Conservation and Management Plan, consideration should be given to development of responsible, compatible uses of this resource with utmost respect for its natural biological systems. The challenge is to manage the human interaction with the bay, including municipal, commercial, industrial, agricultural, and recreational uses so that the utility and long-range value of this resource can be maximized. Accordingly, an important goal is to determine the capacity of the bay to accept and tolerate human interaction, e.g. pollutants, consistent with maintenance and improvement of its biological systems.

Goal I. *It shall be the long-term goal of the State of Texas to maintain and enhance the water quality in the Galveston Bay system, and to reduce and ultimately eliminate harm resulting from the entry of pollutants to the water and sediments, including harm resulting from the alteration of natural estuarine gradients.*

Goal II. *It shall be the long-term goal of the State of Texas to maintain and enhance the living resources in the Galveston Bay system, including commercial, recreational, and ecologically significant species populations, and also including the habitats upon which these species depend.*

Goal III. *It shall be the long-term goal of the State of Texas to prevent increases in human health risks associated with the Galveston Bay system, and to minimize and eventually eliminate human-induced health risks and losses to commerce and recreation due to harvest or contact restrictions.*

several specific Management Committee projects. These include preliminary estimations of the cost of implementing the CCMP, a support project to facilitate the work of drafting and revising the CCMP at the task force level, and a similar support project for the characterization effort. Perhaps the most significant project of the Management Committee in the coming year will be a determination of the economics of natural resources and their use in Galveston Bay. This work takes advantage of recent advances in the field of natural resource economics, to overcome well-known problems that arise in applying traditional economics to publicly-owned resources.

Public participation in FY 1993 will become more important than in any previous year, leading to even greater emphasis in FY 1994. While CCMP action plans are being drafted, participation by the key industries, user groups, local governments, and general public is more important than ever. A renewed emphasis is planned for the Local Governments Advisory Committee, and for public involvement by means of a series of public participation initiatives: Bay Day; the Galveston Bay Speaker's Bureau; the Galveston Bay Public Forum; *BayLine* (our newsletter);

Table 1. Galveston Bay Priority Problems ¹

A. REDUCTION/ALTERATION OF LIVING RESOURCES

1. Loss of Physical Habitat
 - * wetlands and sea grasses
 - * oyster reefs
 - * shallow bay bottom (unvegetated)
2. Alteration of Salinity Gradients
 - * impoundment, diversion, and interbasin transfer of fresh water inflow
 - * bathymetric and circulatory changes (salinity intrusion)
 - * ungaged inflows from rainfall in coastal watersheds
3. Alteration of Nutrient and Organic Loading
 - * eutrophication and hypoxia
 - * point and nonpoint sources
4. Bathymetric and Circulatory Changes
5. Land Subsidence and Sea Level Rise
6. Chemical and Pathogenic Contamination (biotic impairment)
 - * point and nonpoint sources
7. Increased Turbidity and Sedimentation

B. PUBLIC HEALTH ISSUES

1. Discharge of Pathogens to Bay Waters
 - * point and non-point sources
2. Chemical Contamination of Water, Sediments, and Living Organisms
 - * point and nonpoint sources
3. Restriction of Contact Recreation
 - * chemical and pathogenic contamination

C. RESOURCE MANAGEMENT ISSUES

1. Regulatory Problems
2. Fish and Wildlife Resource Depletion
3. Marine Debris
4. Public Access to Resources

D. SHORELINE EROSION

1. Land Subsidence and Sea Level Rise
 2. Bathymetric and Circulatory Change
 3. Loss of Buffer Vegetation (Wetlands)
 4. Use of Littoral Property
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¹ Within the List, the four major problems (identified by letters A-D) are ranked in order of importance and are considered to be independent. The second order problems within each major problem (identified by number) area are interdependent and may contribute to or interact with problems of equal or higher category.

new educational initiatives; and Citizen's Monitoring of the estuary. These are some of the projects of the Citizen's Advisory Steering Committee.

With so many representatives of the Galveston Bay community "at the table" as a result of the Management Conference, ideas for early management actions will continue to arise and be implemented. Some ongoing actions relate to the creation of a Citizen's Pollution Reporting Hotline; the previous creation of two coastal preserves, creation of wetland habitat through cordgrass plantings, and an initiative to prevent pollution in the Houston Ship Channel. An additional action plan demonstration project is anticipated for the coming fiscal year.

Administration of the GBNEP will continue in FY 1993 with very little change. As in previous years, a Management Conference Workshop will be scheduled for Spring, 1993, as a focus for consensus-building and an opportunity to approve plans for Fiscal Year 1994. The substantial administrative work effort to coordinate the sixteen Action Plan Task Forces will require major emphasis. Logistics related to meetings, mailings, and participant coordination for more than 200 individuals now involved with the GBNEP remain an ever-present challenge for program administration.

Figure 1.
Galveston Bay Impact Matrix
Revised 3/26/92

Sources of Perturbation	Valued Ecosystem Components															
	Water Quality	Circula- tion	Sedi- ment	Phyto- plankton	Zoo- plankton	Oysters	Shellfish	Other Benthos	Finfish	Birds	Marine Mammals	Sea Turtles	Human Health	Submerged Wetlands	Plants	Aesthetic Shoreline Appeal
Northers		**		?	?	*			**	*						
Hurricanes		**	*	?	?	*	*	**		*			?	?	***	***
Inflow Modification	***	***	*	?	?	****	***	***	**			?		***	**	
Subsidence/Sea Level		**				*	**		*	*				***	***	***
Shoreline Development	**	*	*	*			**		**	**				***	**	***
Dredging	***	***	***	?		**	*	**	**	***	?	?	?	***	**	**
Shipping	**		*								?			**		**
Point Sources	***		***	***	**	***	**	**	**	**	?	?	***	*	**	**
Non-Point Sources	***		***	***	?	***	**	**	**	**	?	?	***	**	**	**
Commercial Fishing	?		?			**	***	?	***		?	?			**	
Recreational Fishing						*	*		***					?	*	
Boating/Marinas	***		***	?	?			**	*					*	*	?
Petroleum Activity	***		***	?	?	*	**	**	*	*	?	?	*	**	*	?
Oil/Chemical Spills	***		***	?	?	**	?	?	?	**	?	?	**	***	?	***
Marine Debris									?	*	*	**				***

* = Slight influence
 ** = Moderate influence
 *** = Significant influence
 **** = Major influence

? = Unknown relationship
 [Patterned Box] = Possible management priority

Milestone Publications Planned for the Galveston Bay National Estuary Program

1. *Galveston Bay Environmental Characterization Report.* This report is to be a summary of ecological and other technical findings from the Galveston Bay characterization effort. The report is to be written for managers, decision-makers and scientists, but in plain English to the greatest extent possible. The report is written in an ecosystem management context, with the primary goal of conveying complete information about the Priority Problems and related environmental status and trends. The report will be drafted by program staff, with possible contract help. Target publication date: Fall, 1993.

2. *Framework For Action: The Governance of Galveston Bay.* This report is to be a summary of management evaluation findings, based on the Bay-wide Regulatory Survey and Regulatory Evaluation projects, and including lessons learned from the Coastal Preserves management studies. The report will contain findings and policy analyses concerning Bay jurisdictions and management efforts, including gaps, overlaps, and weaknesses in the current regulatory system. The report will be drafted by the Principal Investigator of the Bay-wide Regulatory Evaluation Project, and will include recommendations that will contribute to drafting of the CCMP. Target publication date: Winter, 1993.

3. *The State of the Bay.* This is a public document for wide distribution. Contents will combine summaries of the ecological and regulatory findings of the two preceding reports, with the primary goal of highlighting Galveston Bay's problems and defining the need for a CCMP. The publication will be written by the Program staff in plain English, will be well illustrated, and will be designed to help the public learn more about the Bay and its problems, and to better appreciate the need for improved management. Target publication date: Fall, 1993.

4. *Comprehensive Conservation and Management Plan.* The management plan is to be a series of simplified action plans of no more than several pages each (with detailed supplemental information included as appendices). Each action plan describes a problem, and answers "who, what, when, where, why, and how much questions in a direct way. These action plans are designed for legislators and elected public officials, managers, and the public to easily understand. The CCMP will have implementation and funding strategies associated with recommended actions. Target publication date: Fall, 1994.